Amendments to the Claims:

All amendments and cancellations are made without prejudice and disclaimer. This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1. (Currently amended) An isolated polypeptide having the ability to bind to fibrin, the polypeptide comprising the amino acid sequence: Cys-X_2-X_3-X_4-X_5-X_6-X_7-X_8-Cys (SEQ ID NO: 2), wherein X_2 is Pro, Arg, Asn, Asp, Gln, Gly, Phe, Ser, Thr, or Tyr; X_3 is Ala, Asn, Asp, Gln, Glu, Gly, Ile, Leu, Met, Phe, Pro, Ser, Thr, Trp, Tyr, or Val; X_4 is Glu, Gly, Lys, Ser, or Tyr; X_5 is Pro, Asp, Glu, Asn, Gln, [[Glu,]] Gly, Leu, Lys, Ser, Thr, or Tyr; X_6 is Arg, Gly, or Trp; X_7 is Leu, Ile, Lys, Met, Asn, Gln, Pro, Ser, Thr, or Val; and X_8 is Ile, Leu, Phe, Trp, **or** Tyr.

2. (Original) The polypeptide according to claim 1, comprising the amino acid sequence: Cys-X_2-X_3-X_4-X_5-Trp-X_7-X_8-Cys (SEQ ID NO: 42), wherein X_2 is Pro, Asn, Gln, Ser, or Thr; X_3 is Ala, Asn, Asp, Gln, Glu, Gly, Ile, Leu, Met, Phe, Pro, Ser, Thr, Trp, Tyr, or Val; X_4 is Glu or Ser; X_5 is Pro, Asp, Glu, Asn, Gln, Ser, Thr, or Tyr; X_7 is Leu, Ile, Met, Asn, Gln, Ser, Thr, or Val; and X_8 is Phe, Trp, or Tyr.

3. (Currently amended) The polypeptide according to claim 1, wherein ~~the following amino acid positions are independently selected as follows: the amino acid residue~~ X_2 is Pro[[,]]; ~~the amino acid residue~~ X_3 is Asp, Glu, Gly, Met, or Trp[[,]]; ~~the amino acid residue~~ X_4 is Glu[[,]]; ~~the amino acid residue~~ X_5 is Asn, Asp, Glu, Pro, or Ser[[,]]; ~~the amino acid residue~~ X_6 is Trp[[,]]; ~~the amino acid residue~~ X_7 is Leu or Thr[[,]]; and ~~the amino acid residue~~ X_8 is Phe~~, or combinations of such selections~~.

4. (Currently amended) The polypeptide according to claim 1, wherein the polypeptide comprises an amino acid sequence selected from the group consisting of:

Cys-Ser-Asp-Glu-Asn-Trp-Leu-Trp-Cys (SEQ ID NO: 21)[[,]];

Cys-Pro-Met-Ser-Glu-Trp-Leu-Tyr-Cys (SEQ ID NO: 22)[[,]];

Cys-Pro-Trp-Glu-Ser-Trp-Thr-Phe-Cys (SEQ ID NO: 23)[[,]];

Cys-Gln-Glu-Glu-Pro-Trp-Leu-Phe-Cys (SEQ ID NO: 24)[[,]];

Cys-Pro-Gly-Glu-Asp-Trp-Leu-Phe-Cys (SEQ ID NO: 25)[[,]];

Cys-Tyr-Gly-Glu-Ser-Gly-Ile-Phe-Cys (SEQ ID NO:43);

Cys-Thr-Gly-Glu-Pro-Gly-Pro-Ile-Cys (SEQ ID NO:44);

Cys-Gln-Leu-Gly-Tyr-Arg-Thr-Tyr-Cys (SEQ ID NO:45);

Cys-Asp-Gly-Glu-Pro-Trp-Leu-Phe-Cys (SEQ ID NO:46);

Cys-Gly-Trp-Gly-Ser-Trp-Lys-Phe-Cys (SEQ ID NO:47);

Cys-Gly-Trp-Gly-Ser-Gly-Lys-Leu-Cys (SEQ ID NO:48);

Cys-Pro-Gly-Glu-Pro-Trp-Thr-Phe-Cys (SEQ ID NO:49);

Cys-Pro-Gly-Glu-Pro-Trp-Thr-Phe-Cys (SEQ ID NO:50);

Cys-Pro-Gly-Tyr-Leu-Arg-Ser-Leu-Cys (SEQ ID NO: 51);

Cys-Pro-Gly-Glu-Pro-Trp-Ser-Phe-Cys (SEQ ID NO:52);

Cys-Arg-Gly-Glu-Ser-Trp-Pro-Tyr-Cys (SEQ ID NO:53);

Cys-Pro-Gly-Tyr-Lys-Arg-Gln-Phe-Cys (SEQ ID NO:54);

Cys-Gly-Gln-Glu-Ser-Arg-Thr-Phe-Cys (SEQ ID NO:55); and

Cys-Phe-Gln-Lys-Gly-Gly-Thr-Leu-Cys (SEQ ID NO:56).

5. (Canceled)

6. (Currently amended) ~~The polypeptide according to claim 1,~~ An isolated polypeptide having the ability to bind to fibrin, the polypeptide comprising the amino acid sequence: X_1-X_2-X_3-X_4-X_5-X_6-X_7-X_8-X_9-X_{10}-X_{11}-X_{12}-X_{13}-X_{14}–X_{15} (SEQ ID NO:1), wherein X_1 is Cys, Pro, or

Trp; X_2 is Ala, Arg, Asn, Asp, Gln, Glu, Gly, His, Ile, Leu, Lys, Met, Phe, Pro, Ser, Thr, Trp, Tyr or Val, or if X_4 and X_{12} are not Cys, then X_2 may be Cys; X_3 is Ala, Asn, Gln, Gly, Ile, Leu, Met, Phe, Pro, or Thr; X_4 is Cys or another amino acid capable of forming a covalent cross-link to X_{12}; X_5 is Pro, Arg, Asn, Asp, Gln, Gly, Phe, Ser, Thr or Tyr; X_6 is Ala, Asn, Asp, Gln, Glu, Gly, Ile, Leu, Met, Phe, Pro, Ser, Thr, Trp, Tyr, or Val; X_7 is Glu, Gly, Lys, Ser, or Tyr; X_8 is Pro, Asp, Glu, Asn, Gln, Glu, Gly, Leu, Lys, Ser, Thr, or Tyr; X_9 is Arg, Gly, or Trp; X_{10} is Leu, Ile, Lys, Met, Asn, Gln, Pro, Ser, Thr, or Val; X_{11} is Ile, Leu, Phe, Trp, or Tyr; X_{12} is Cys or another amino acid capable of forming a covalent cross-link to X_4; X_{13} is Cys, Gly, Leu, Phe, Pro, Trp, or Tyr; X_{14} is Pro, Ala, Gly, Asn, Gln, Lys, Ser, Thr, Tyr, Asp, Glu, or His; and X_{15} is Ala, Arg, Asp, Ile, Leu, Met, Phe, Pro, Trp, Val, Asn, Gln, Gly, Ser, Thr, Tyr, or His.

7. (Original) The polypeptide according to claim 6, comprising the amino acid sequence: Trp-X_2-X_3-X_4-X_5-X_6-X_7-X_8-Trp-X_{10}-X_{11}-X_{12}-X_{13}-X_{14}–X_{15} ((SEQ ID NO:41), wherein X_2 is Ala, Arg, Asn, Asp, Gln, Glu, Gly, His, Ile, Leu, Lys, Met, Phe, Pro, Ser, Thr, Trp, Tyr or Val, or if X_4 and X_{12} are not Cys, then X_2 may be Cys; X_3 is Ala, Asn, Gln, Gly, Ile, Leu, Met, Phe, or Pro; X_4 is Cys or another amino acid capable of forming a covalent cross-link to X_{12}; X_5 is Pro, Asn, Gln, Ser, or Thr; X_6 is Ala, Asn, Asp, Gln, Glu, Gly, Ile, Leu, Met, Phe, Pro, Ser, Thr, Trp, Tyr, or Val; X_7 is Glu or Ser; X_8 is Pro, Asp, Glu, Asn, Gln, Ser, Thr, or Tyr; X_{10} is Leu, Ile, Met, Asn, Gln, Ser, Thr, or Val; X_{11} is Phe, Trp, or Tyr; X_{12} is Cys or another amino acid capable of forming a covalent cross-link to X_4; X_{13} is Phe, Trp, or Tyr; X_{14} is Pro, Ala, Gly, Asn, Gln, Ser, Thr, Tyr, Asp, Glu, or His; and X_{15} is Ala, Ile, Leu, Met, Phe, Pro, Trp, Val, Asn, Gln, Gly, Ser, Thr, Tyr, or His.

8. (Currently amended) The polypeptide according to claim 7, wherein ~~the following amino acid positions are independently selected as follows: the amino acid residue~~ X_2 is Ala, Gln, Glu, Lys, or Met; ~~the amino acid residue~~ X_3 is Ala, Leu, Met, or Pro; ~~the amino acid residue~~ X_4 is Cys; ~~the amino acid residue~~ X_5 is Pro; ~~the amino acid residue~~ X_6 is Asp, Glu, Gly, Met, or Trp; ~~the amino acid residue~~ X_7 is Glu; ~~the amino acid residue~~ X_8 is Asn, Asp, Glu, Pro, or Ser;

~~the amino acid residue~~ X_{10} is Leu or Thr; ~~the amino acid residue~~ X_{11} is Phe; ~~the amino acid residue~~ X_{12} is Cys; ~~the amino acid residue~~ X_{13} is Trp; ~~the amino acid residue~~ X_{14} is Asp, Gly, His, Phe, or Ser; and ~~the amino acid residue~~ X_{15} is Ala, Gly, His, Pro, or Ser~~, or combinations of such selections~~.

9. (Currently amended) The polypeptide according to claim 8, wherein ~~the following amino acid positions are independently selected as follows: the amino acid residue X_5 is Pro, the amino acid residue X_7 is Glu,~~ the amino acid residue X_{10} is Leu~~, the amino acid residue X_{11} is Phe, the amino acid residue X_{13} is Trp, or combinations of such selections~~.

10. (Currently amended) The polypeptide according to claim 6, wherein the polypeptide comprises an amino acid sequence selected from the group consisting of:

Trp-Glu-Leu-Cys-Ser-Asp-Glu-Asn-Trp-Leu-Trp-Cys-Trp-Pro-His (SEQ ID NO: 3)[[,]];
Trp-Met-Met-Cys-Pro-Met-Ser-Glu-Trp-Leu-Tyr-Cys-Trp-Ser-Ala (SEQ ID NO: 4)[[,]];
Trp-Gln-Pro-Cys-Pro-Trp-Glu-Ser-Trp-Thr-Phe-Cys-Trp-Asp-Pro (SEQ ID NO: 5)[[,]];
Trp-Ala-Pro-Cys-Gln-Glu-Glu-Pro-Trp-Leu-Phe-Cys-Phe-His-Gly (SEQ ID NO: 6)[[,]];
Trp-Lys-Ala-Cys-Pro-Gly-Glu-Asp-Trp-Leu-Phe-Cys-Trp-Gly-Ser (SEQ ID NO: 7)[[,]];
Pro-Arg-Pro-Cys-Tyr-Gly-Glu-Ser-Gly-Ile-Phe-Cys-Trp-Lys-Val (SEQ ID NO:27);
Pro-Arg-Pro-Cys-Thr-Gly-Glu-Pro-Gly-Pro-Ile-Cys-Gly-Pro-Arg (SEQ ID NO:28);
Trp-Gln-Ala-Cys-Gln-Leu-Gly-Tyr-Arg-Thr-Tyr-Cys-Trp-Asp-Gly (SEQ ID NO:29);
Trp-Lys-Phe-Cys-Asp-Gly-Glu-Pro-Trp-Leu-Phe-Cys-Trp-Asp-Gly (SEQ ID NO:30);
Trp-Asn-Gly-Cys-Gly-Trp-Gly-Ser-Trp-Lys-Phe-Cys-Gly-Glu-Gly (SEQ ID NO:31);
Trp-Leu-Asn-Cys-Gly-Trp-Gly-Ser-Gly-Lys-Leu-Cys-Leu-Gly-Val (SEQ ID NO:32);
Cys-Tyr-Phe-Cys-Pro-Gly-Glu-Pro-Trp-Thr-Phe-Cys-Cys-Asp-Asp (SEQ ID NO:33);
Trp-His-Phe-Cys-Pro-Gly-Glu-Pro-Trp-Thr-Phe-Cys-Trp-Ala-Gly (SEQ ID NO:34);
Trp-Gln-Thr-Cys-Pro-Gly-Tyr-Leu-Arg-Ser-Leu-Cys-Trp-Asp-Gly (SEQ ID NO:35);
Trp-Tyr-Phe-Cys-Pro-Gly-Glu-Pro-Trp-Ser-Phe-Cys-Pro-Asp-Gly (SEQ ID NO:36);
Pro-Arg-Pro-Cys-Arg-Gly-Glu-Ser-Trp-Pro-Tyr-Cys-Trp-Gly-Gly (SEQ ID NO:37);

Trp-Gln-Ala-Cys-Pro-Gly-Tyr-Lys-Arg-Gln-Phe-Cys-Trp-Asp-Arg (SEQ ID NO:38);

Pro-Arg-Pro-Cys-Gly-Gln-Glu-Ser-Arg-Thr-Phe-Cys-Leu-Glu-Gly (SEQ ID NO:39);

and

Pro-Arg-Pro-Cys-Phe-Gln-Lys-Gly-Gly-Thr-Leu-Cys-Trp-Pro-Gly (SEQ ID NO:40).

11. (Canceled)

12. (Withdrawn-currently amended) A method of detecting fibrin in a mammalian subject comprising the steps of: (a) detectably labeling a polypeptide according to any one of claims 1-4 or 6-10[[1-11]]; (b) administering to said subject the labeled polypeptide and, thereafter, (c) detecting the labeled polypeptide in the subject.

13. (Withdrawn-currently amended) The method according to claim 12, wherein said label is fluorescent, echogenic, radioactive, or paramagnetic.

14. (Withdrawn) The method according to claim 12, wherein said label is ^{111}In or ^{99m}Tc.

15. (Withdrawn-currently amended) The method of according to claim 12, wherein said detecting step is indicative of deep-vein thrombosis, pulmonary embolism, cardiogenic thrombosis, atherosclerosis, or stroke.

16. (Withdrawn-currently amended) A method of treating a disease involving thrombus formation, comprising the step: administering to a mammalian subject in need of treatment for such a disease a composition comprising a polypeptide according to any one of claims 1-4 or 6-10[[1-11]] conjugated with a pharmaceutical effective for treating said disease involving thrombus formation.

17. (Withdrawn) The method according to claim 16, wherein said disease is deep-vein thrombosis, pulmonary embolism, cardiogenic thrombosis, atherosclerosis, myocardial infarct, reperfusion ischemia, or stroke.

18. (Withdrawn) The method according to claim 16, wherein said pharmaceutical is a thrombolytic agent selected from tPA, streptokinase, and urokinase.

19. (Withdrawn-currently amended) A recombinant host cell or bacteriophage expressing on its surface an exogenous fibrin binding polypeptide according to any one of claims 1-4 or 6-10[[1-11]].

20. (Currently amended) A magnetic resonance imaging contrast agent comprising at least one paramagnetic metal atom linked to at least one polypeptide according to any one of claims 1-4 or 6-10[[1-11]].

21. (Currently amended) The magnetic resonance imaging contrast agent according to claim 20, wherein said magnetic resonance imaging contrast agent further comprises at least one chelator selected from the group consisting of diethylenetriaminepentaacetic acid, 1,4,7,10-tetraazacyclotetradecane-1,4,7,10-tetraacetic acid, ethylenediaminetetraacetic acid, 1,4,8,11-tetraazacyclotetradecane-1,4,8,11-tetraacetic acid, ethylenebis-(2-hydroxyphenylglycine), bis-2 (hydroxybenzyl)-ethylene-diaminediacetic acid, 1,4,7-triazacyclononane N,N',N''-triacetic acid, 1,4,7,10-tetraazacyclotetradecane-1,4,7,10-tetra(methyl tetraacetic acid), 1,4,8,11-tetraazacyclotetradecane-1,4,8,11-(methyl tetraacetic acid), 1,3-propylenediaminetetraaceticacid, triethylenetetraaminehexaacetic acid, 1,5,10-N,N',N''-tris(2,3-dihydroxybenzoyl)-tricatecholate, and 1,3,5-N,N',N''-tris(2,3-dihydroxybenzoyl) aminomethylbenzene~~DTPA, DOTA, EDTA, TETA, EHPG, HBED, NOTA, DOTMA, TETMA, PDTA, TTHA, LICAM, and MECAM~~.

22. (Original) The magnetic resonance imaging contrast agent according to claim 21, wherein said chelator comprises diethylenetriamine or tetraazacyclododecane or a carboxymethyl-substituted derivative thereof.

23. (Original) The magnetic resonance imaging contrast agent according to claim 21, wherein said paramagnetic metal atom is selected from the group consisting of: Mn^{2+}, Cu^{2+}, Fe^{2+}, Co^{2+}, Ni^{2+}, Gd^{3+}, Eu^{3+}, Dy^{3+}, Pr^{3+}, Cr^{3+}, Co^{3+}, Fe^{3+}, Ti^{3+}, Tb^{3+}, Nd^{3+}, Sm^{3+}, Ho^{3+}, Er^{3+}, Pa^{4+}, and Eu^{2+}.

24. (Original) The magnetic resonance imaging contrast agent according to claim 23, wherein said paramagnetic metal atom is Gd^{3+}.

25. (Withdrawn-currently amended) A method for identifying fibrin binding compounds comprising the steps of utilizing a fibrin binding polypeptide according to any one of claims 1-4 or 6-10[[1-11]] to form a complex with a fibrin target, contacting said complex with one or more potential fibrin binding compounds, and determining whether said one or more potential fibrin binding compounds competes with said fibrin binding polypeptide to form a complex with said fibrin target.

26. (Withdrawn-currently amended) A method for identifying fibrin binding compounds comprising the steps of contacting a solution containing a potential fibrin binding compound with fibrin target to form a complex between said compound and the fibrin target, contacting said complex with a fibrin binding polypeptide according to any one of claims 1-4 or 6-10[[1-11]], and determining whether said fibrin binding polypeptide competes with said potential fibrin binding compound to form a complex with said fibrin target.

27. (Currently amended) A diagnostic imaging agent comprising a polypeptide according to any one of claims 1-4 or 6-10[[1-11]] linked to a detectable label.

28. (Original) The imaging agent according to claim 27, wherein said polypeptide is radiolabeled.

29. (Original) The imaging agent according to claim 27, wherein said polypeptide is labeled with ^{99m}Tc.

30. (Original) The imaging agent according to claim 27, wherein said polypeptide is fluoresceinated.

31. (Original) The imaging agent according to claim 27, wherein said polypeptide is linked to an echogenic label suitable for ultrasound imaging.

32. (Withdrawn-currently amended) A method of medical imaging comprising the steps of administering to a mammalian subject a pharmaceutical preparation of a contrast agent comprising at least one polypeptide according to any one of claims 1-4 or 6-10[[1-11]] and imaging said contrast agent by a step selected from the group consisting of magnetic resonance imaging, ultrasound imaging, optical imaging, sonoluminescence imaging, photoacoustic imaging, and nuclear imaging.

33. (Withdrawn) The method of medical imaging according to claim 32, wherein said administering step is selected from among the group consisting of: inhaling, transdermal absorbing, intramuscular injecting, subcutaneous injecting, intravenous injecting, and intra-arterial injecting.

34. (Withdrawn) The method of medical imaging according to claim 32, wherein said pharmaceutical preparation is packaged in a container selected from among the group consisting of: kit, syringe, vial, bottle, flexible container, packet, or inhaler.

35. (Withdrawn-currently amended) A method of purifying fibrin or fibrin-like polypeptide from a solution containing it comprising contacting the solution with at least one polypeptide according to any one of claims 1-4 or 6-10[[1-11]], and then separating said polypeptide from said solution.

36. (New) The polypeptide according to claim 3, wherein the polypeptide comprises the sequence Cys-Pro-Trp-Glu-Ser-Trp-Thr-Phe-Cys (SEQ ID NO: 23).

37. (New) The polypeptide according to claim 3, wherein the polypeptide comprises the sequence Trp-Gln-Pro-Cys-Pro-Trp-Glu-Ser-Trp-Thr-Phe-Cys-Trp-Asp-Pro (SEQ ID NO: 5).

38. (New) The polypeptide according to claim 3, wherein X_2 is Pro.

39. (New) The polypeptide according to claim 3, wherein X_3 is Asp, Glu, Gly, Met, or Trp.

40. (New) The polypeptide according to claim 3, wherein X_4 is Glu.

41. (New) The polypeptide according to claim 3, wherein X_5 is Asn, Asp, Glu, Pro, or Ser.

42. (New) The polypeptide according to claim 3, wherein X_6 is Trp.

43. (New) The polypeptide according to claim 3, wherein X_7 is Leu or Thr.

44. (New) The polypeptide according to claim 3, wherein X_8 is Phe.

45. (New) The polypeptide according to claim 7, wherein X_2 is Ala, Gln, Glu, Lys, or Met.

46. (New) The polypeptide according to claim 7, wherein X_3 is Ala, Leu, Met, or Pro.

47. (New) The polypeptide according to claim 7, wherein X_4 is Cys.

48. (New) The polypeptide according to claim 7, wherein X_5 is Pro.

49. (New) The polypeptide according to claim 7, wherein X_6 is Asp, Glu, Gly, Met, or Trp.

50. (New) The polypeptide according to claim 7, whereinX_7 is Glu.

51. (New) The polypeptide according to claim 7, wherein X_8 is Asn, Asp, Glu, Pro, or Ser.

52. (New) The polypeptide according to claim 7, wherein X_{10} is Leu or Thr.

53. (New) The polypeptide according to claim 7, wherein X_{11} is Phe.

54. (New) The polypeptide according to claim 7, wherein X_{12} is Cys.

55. (New) The polypeptide according to claim 7, wherein X_{13} is Trp.

56. (New) The polypeptide according to claim 7, wherein X_{14} is Asp, Gly, His, Phe, or Ser.

57. (New) The polypeptide according to claim 7, wherein X_{15} is Ala, Gly, His, Pro, or Ser.

58. (New) The polypeptide according to claim 7, wherein X_{10} is Leu.

59. (New) The polypeptide according to claim 7, wherein X_3 is Pro.

60. (New) The polypeptide according to claim 7, wherein X_{11} is Phe.

61. (New) The polypeptide according to claim 7, wherein X_{13} is Trp or Phe.